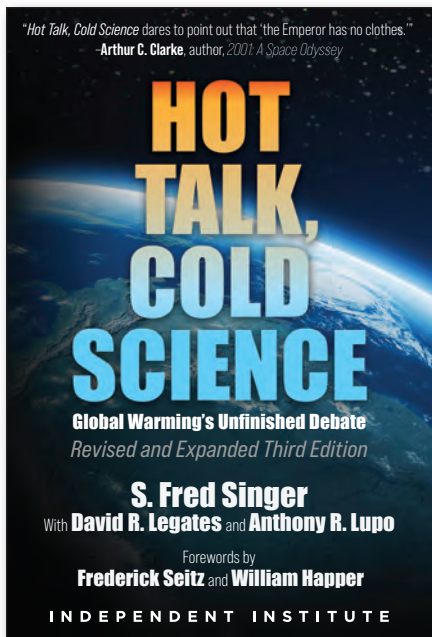


Hot Talk, Cold Science

Global Warming's Unfinished Debate, 3rd Edition

BY S. FRED SINGER with DAVID R. LEGATES and ANTHONY R. LUPO

Forewords by Fredrick Seitz and William Happer



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I N S T I T U T E

Book Highlights

- **Twenty-two years after the publication of *Hot Talk, Cold Science, 2nd Edition*, S. Fred Singer's classic primer on global warming—and antidote to alarmism—has been brought up to date, incorporating numerous recent scientific findings and making this fascinating and complex subject accessible to general readers.** With assistance from climate scientists David R. Legates and Anthony R. Lupo, the late Dr. Singer has produced a clear-headed work of scope and substance that no one who claims to value science, the environment, and human well-being can afford to ignore.
- **Aside from the difficult, often-perplexing scientific issues related to climate change, the topic is marred by “hot talk”—overheated rhetoric that has politicized and misinforms public discussion.** The Climategate email scandal, for example, revealed that key IPCC scientists were hiding their raw temperature data and the methodology of their selection and adjustments, conspiring to delete incriminating emails, and undermining the peer-review system to make it difficult for skeptical scientists to publish their work in scientific journals.
- **The fact of observed global warming—roughly 0.5°C (0.9°F) over the past 130 years—is evidence of neither a greenhouse effect nor human activity.** We must accept the possibility that this warming had the same causes as the unexplained Medieval Warming Period (900-1300 AD) and natural recovery from the Little Ice Age (1450-1850 AD). Additional warming of about 1°C may occur over the next few centuries regardless of what humans do.
- **Claims about a recent global warming trend are based the surface temperature record, but this record is inconsistent with data from other sources.** Warming alleged to have occurred from 1978 to 1997, for example, is based on just one database of surface observations, whereas data showing no trend during this period come from oceans, lower-atmosphere satellite-based readings, and proxy data. Satellite-based temperature readings are accurate and truly global, and they show a minor warming trend well below that predicted by the models.
- **The existence of the global warming “pause” from the early 2000s to the mid-2010s—and the failure of dozens of IPCC models to predict it—cannot be ignored by scientists or responsible political leaders.** Present models cannot properly handle clouds and other important climate factors.
- **Catastrophic sea level rise is not a foregone conclusion.** Sea level has been rising since the Ice Age 18,000 years ago, but theory alone can't predict whether additional warming will accelerate sea level rise. It's conceivable that sea level could fall due to increased evaporation, precipitation, and accumulation of ice on Greenland and Antarctica. From 1915 to 1945, when surface temperatures warmed by about 0.5°C, sea level rise did not accelerate.

Synopsis

Is climate change harming Earth's biosphere and human well-being? How should policymakers respond to the possibility that greenhouse gases emitted by human activity, chiefly from the burning of fossil fuels, can lead to global warming? Is there a single book on climate science and policy that serves as both an accessible starting point for lay readers and a concise summary of new studies useful to those already versed in these complex and vital issues?

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About the Authors

In 1997 atmospheric physicist **S. Fred Singer**—the founding director of the U.S. Weather Satellite Center—wrote the first edition of *Hot Talk, Cold Science: Global Warming's Unfinished Debate*. A second edition came two years later, and the book is now deemed a classic. Dr. Singer passed away in 2020, but not before expanding and updating his much-discussed book with assistance from climatologist **David R. Legates** (University of Delaware) and atmospheric scientist **Anthony R. Lupo** (University of Missouri).

Incorporating recent developments in science, economics, and public policy, *Hot Talk, Cold Science, 3rd Edition* is a badly needed de-coding device to a sprawling, highly technical literature, giving readers a clear understanding of what scientists and policymakers know about climate change—and what they don't. By separating rhetoric from reality, this well-timed release allows readers to better detect and think beyond the hyperbole and propaganda all-too-common in media coverage of this heated subject.

The stakes in this global debate, Dr. Singer reminds us, are monumental. With some calling for restrictions or carbon taxes to reduce the use of fossil fuels and get climate change under control, and others warning that impeding access to affordable energy would consign large segments of the world's population to deeper, more prolonged poverty, the only ground shared by all sides may be a burning sense of urgency for more research and education. By bringing vital but often neglected findings to the forefront of the reading public, *Hot Talk, Cold Science: Global Warming's Unfinished Debate, 3rd Edition* can play a critical part in stimulating fresh discussion on the most important scientific and policy issue of our times.

Hot Talk

Like the entire temperature record, the timeline of rhetoric about climate worries

is marked by periods of advancement and retreat. By the mid 20th century, scientists had known for decades that atmospheric concentrations of carbon dioxide (CO₂) were rising due to the burning of fossil fuels—oil, gas, and especially coal. Most thought it wasn't cause for concern: water vapor, they believed, was already absorbing any long-wave radiation that might otherwise cause additional CO₂ to exert a greenhouse effect. Moreover, air temperatures had been declining since about 1940, prompting some to worry that air pollution and human activity could hasten the onset of another ice age.

Fear of global warming didn't gain momentum until the 1980s. In 1979, the National Academy of Sciences speculated that water vapor feedback would cause a doubling of atmospheric CO₂ to increase temperatures by 1.5° to 4.5° Celsius. More alarming, temperatures rose rapidly from 1975 to 1980. At a time when Western nations were showing progress on water and air pollution, environmentalists increasingly took up the cause of global warming.

In 1988, as heat waves and droughts swept North America, hot talk reached a new peak. U.S. Senate hearings drew massive attention when NASA scientist James Hansen testified that he was "99 percent" sure that global warming had arrived. Unconvinced, Dr. Singer published that summer an op-ed in the *Wall Street Journal* arguing that "observed trends do not agree with expectation from greenhouse theory" and laying out scientists' uncertainties about climate change. (The essay is one of seven short pieces reprinted in the book and recalling Dr. Singer's key role throughout the climate debates.)

The year 1988 also saw the founding of the United Nations' Intergovernmental Panel on Climate Change (IPCC), a scientific body whose reports have greatly shaped—and been shaped by—the views of policymakers. What followed was a series of meetings, in Rio de Janeiro, Berlin,

Geneva, Kyoto, Madrid, and Paris, convened to lay the groundwork for a treaty restricting and reducing greenhouse gas emissions. The IPCC has been a key driver for a global treaty and a source of misinformation and alarmist rhetoric—on catastrophic droughts, floods, storms, rapid sea-level rise, a collapse of agriculture, and a spread of tropical disease—messaging adopted and amplified by environmental groups and media around the world. The organization has also repeatedly hid scientific uncertainty, the absence of critical data, and evidence that questions or contradicts its apocalyptic prediction.

The IPCC has walked back some of its earlier alarmist claims, but it hasn't been the only scientific authority to pass off misinformation. In the late 1990s, geoscientist Michael Mann got media attention by publishing his “hockey stick” graph, purporting to show nearly one thousand years of flat temperatures in the Northern Hemisphere, until spiking around the turn of the 20th century with the surge of industrial civilization. Later analysis found Mann's inferences and methods lacking, and his graph was dropped from subsequent IPCC reports. A different episode—dubbed Climategate—uncovered emails from the Climate Research Unit suggesting unethical attempts to hide raw data and to prevent climate “skeptics” from getting published in top scientific journals. The media coverage may have played a decisive role in cooling the public's enthusiasm for a global climate treaty.

Cold Science

Scientists of all stripes overwhelmingly agree on several key issues related to climate. They agree, for example, that human activity has increased levels of greenhouse gases in the atmosphere; and that the leading greenhouse gas is water vapor (which along with atmospheric CO₂ has kept the oceans from freezing over).

Moreover, what scientists know about global trends in climate events and other phenomena often run counter to popular belief: Severe storms have not increased in frequency or intensity since 1970 (except in the eastern North Pacific); heat waves and droughts are not becoming more common; global warming is not harming coral reefs; and sea levels are not rising any faster than usual.

Unfortunately, what we think we know about climate change is dwarfed by what we don't know, and the gaps in our knowledge lead to disagreements. Scientists disagree, for instance, about why rising levels of greenhouse gases have not caused the degree of global warming predicted by current climate models; they disagree over whether changes in global temperature or other climate elements are due to increased concentrations of greenhouse gases (especially CO₂) in the atmosphere; and they disagree about what constitutes the “right” or “best” atmospheric levels of CO₂ and global temperatures for humans or for the natural world. The list goes on.

Temperature data—past and present—are fundamental in the climate change debate. The only reliable global temperature record, however, comes from satellite-based readings of lower-atmosphere temperatures taken since 1979. When that record is used to test the accuracy of models that purport to show the impact of human activity on Earth's climate, the models invariably fail, revealing that human-caused CO₂ emissions have little or even no influence on global temperatures.

The gap between temperature observations and model estimates raises a key question: Why does CO₂ appear to no longer affect the climate? Dr. Singer offers informed speculation (but notes that his hypothesis is counterintuitive and has yet to be tested).

What about sea level rise? Here is another area where specialists depart from

common belief. The rate of sea level rise isn't accelerating. Local coastal sea level rise, however, is highly variable worldwide, depending on differing rates at which coasts undergo tectonic uplift or subsidence of the shoreline, as groundwater and minerals are extracted. Dr. Singer forecasts sea level rise in the range of 18 to 20 centimeters by 2100. Presumably due to improved evidence and methods, the IPCC has reduced its maximum forecasts to 59 centimeters (IPCC 2007), down from 367 centimeters (IPCC 1990).

The climate change debate can be understood as just one more clash between economic and technological pessimists (“Malthusians”) and optimists (“Cornucopians”). These opposing groups have clashed over economic development, resource depletion, and environmental progress. A full assessment must take stock of the benefits of modest warming, such as its boon for plant and animal life in nearly all parts of the globe and positive effects on human health. The conflict of visions also surfaces in regard to which response to global warming is given priority: mitigation, CO₂ sequestration, or human adaptation. Dr. Singer argues that adaptation has more associated benefits.

In their afterword to *Hot Talk, Cold Science, 3rd Edition*, climatologists David R. Legates and Anthony R. Lupo state that no one was more qualified to write a book incorporating recent developments in the science and politics of climate change than Dr. Singer. “His myriad of accomplishments serves to illustrate why he is one of the very few people who have both the requisite political experience and the scientific background,” Drs. Legates and Lupo write. “Over the years and despite all the invectives poured upon him by the alarmists, Dr. Singer has stood his ground for scientific integrity and adherence to the scientific method. For that, he is to be greatly commended.”

About the Authors



S. FRED SINGER (1924-2020) A pioneer in the development of rocket and satellite technology, Dr. Singer designed the first satellite instrument for measuring atmospheric ozone and was a principal developer of scientific and weather satellites. He was a research fellow at the Independent Institute, founder and chairman emeritus of the Science and Environmental Policy Project (SEPP), founder of the Nongovernmental International Panel on Climate Change (NIPCC), and professor emeritus at the University of Virginia, where he taught from 1971 to 1994. Dr. Singer received his PhD in physics from Princeton University.

Dr. Singer was the recipient of the White House Special Commendation, Gold Medal Award from the US Department of Commerce, and first Science Award from the British Interplanetary Society. A fellow of the American Association for the Advancement of Science, he received an honorary doctorate from Ohio State University and was elected to the International Academy of Astronautics.

Dr. Singer was the author, coauthor, or editor of many books, including *The Changing Global Environment*, *Free Market Energy*, *Global Climate Change*, *Is There an Optimum Level of Population?*, *Unstoppable Global Warming: Every 1,500 Years*, and five volumes in the *Climate Change Reconsidered* series. He was also the author of more than 400 technical articles in scientific, economics, and public policy journals plus more than 400 articles in popular publications including the *Wall Street Journal*, *New York Times*, *Washington Post*, and online at *American Thinker*.



DAVID R. LEGATES is a research fellow at the Independent Institute, Deputy Assistant Secretary of Commerce for Observation and Prediction, Executive Director of the United States Global Change Research Program, and Professor of Climatology in the Department of Geography and an Adjunct Professor in the Department of Applied Economics and Statistics at the University of Delaware. He received his PhD in climatology from the University of Delaware and has taught at Louisiana State University, University of Oklahoma, and University of Virginia. He has been research scientist at the Southern Regional Climate Center, chief research scientist at the Center for Computational Geosciences, and visiting research scientist at the National Climate Data Center. Presently, he serves as the Deputy Assistant Secretary of Commerce for Environmental Observation and Prediction.

Dr. Legates has been published more than 125 times in refereed journals, conference proceedings, and monograph series and has made more than 250 professional presentations. His research has appeared in such journals as the *International Journal of Climatology*, *The Professional Geographer*, *Journal of Geophysical Research*, *Journal of Environmental Hydrology*, *Journal of Climate*, *Climatic Change*, *Bulletin of the American Meteorological Society*, *Water Resources Bulletin*, *Geographical Review*, *Global and Planetary Change*, *Journal of Hydrology*, *Theoretical and Applied Climatology*, *The American Cartographer*, and *Journal of Geophysical Research*. He is a contributor to the *Encyclopedia of Climate and Weather* and *Yearbook of Science and Technology*.



ANTHONY R. LUPO is a research fellow at the Independent Institute and professor of Atmospheric Science, and principal investigator of the Global Climate Change Group in the School of Natural Resources at the University of Missouri. He received his PhD in atmosphere science from Purdue University, and he has been a member of the Working Groups I and III for the Intergovernmental Panel on Climate Change (IPCC), research scholar at the Belgorod University in Russia, Fulbright Research Scholar at the Russian Academy of Sciences, associate editor of the *Monthly Weather Review*, and postdoctoral research associate in the Department of Earth and Atmospheric Sciences at the University at Albany.

Dr. Lupo is the author of 135 peer-reviewed publications including in such scientific journals as *Advances in Environmental Biology*; *Advances in Meteorology*; *Atmosfera*; *Atmosphere*; *Atmospheric and Climate Science*; *Atmospheric Environment*; *Atmospheric Research*; *Atmospheric Science Letters*; *Bulletin of the American Meteorological Society*; *Climate Dynamics*; *Current Climate Change Reports*; *Doklady*; *Dynamics of Atmospheres and Ocean*; *Papers in Applied Geography*; *Forests*; *Genesis and Geography of Soils*, *Eurasian Soil Science*; *Geography*, *Environment*, *Sustainability*; *Global and Planetary Change*; *Hydrological Process*; *International Journal of Biometeorology*; *International Journal of Climatology*;



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